

1914

Olaa Forest Park.

REPORT OF THE SUPERINTENDENT OF FORESTRY.

Honolulu, Hawaii July 15, 1914.

Board of Commissioners of Agriculture and Forestry, Honolulu.

Gentlemen:—I have to recommend as follows the creation of a small forest reserve in the Olaa section, Puna district, Hawaii, to be known as the “Olaa Forest Park Reserve.”

The purpose of this project is to preserve for its beauty, its scenic interest and its scientific value the last remaining strip of the heavy native Hawaiian forest along the Volcano road, together with a grove of koa trees facing the road at 29 Miles. The former area consists of the untaken Olaa homestead lots bordering the Volcano road, *mauka* of Glenwood, between the twenty-three and the twenty-five mile posts. It is the one place in the Territory where without effort or exertion the visitor to the Islands can still see the dense native forest in its primitive condition.

The Glenwood Forest.

The area proposed to be set apart consists essentially of lots Nos. 363, 364, 277 to 380, and 389 to 391 of the original Olaa Tract homestead subdivision, a total of 374 acres. All of these lots still vest in the government. The majority of them were never taken up. Those that were have since reverted to the Territory. All are covered with heavy forest, consisting of a stand made up principally of large *ohia lehua* trees with a dense undergrowth of ferns, vines and shrubs. The lots named form a solid block across which runs the Volcano road. Adjoining this block are a number of privately-owned lots, on which the forest cover is of like character. It is the intention of the owners of these lots to continue to protect the forest on them. In effect this increases the size of the proposed reserve and insures the perpetuation of a block of forest large enough to maintain itself. [page 278]

The government lots, especially those to the south of the road, are said to be extremely rocky, so that their value for agriculture would at best be but small. On the other hand the forest on these lots makes them, because of their location, of unique value to the Territory.

Ever since the Volcano road was first built, the Hawaiian forest along its course has been one of the most exploited features of the Island of Hawaii. With increasing attention to building up the tourist trade in the Territory it is strictly a business proposition to preserve and develop all places of special scenic attraction. From the tourist point of view the drive from Glenwood to the Volcano is a distinct asset.

“But this forest is not alone of interest from the superficial standpoint of the passing tourist. With the opening up of the surrounding country, it will have increasing scientific interest from a botanical standpoint, while it may also well serve as a refuge for some of the remaining Hawaiian birds.”

These being the objects of the reservation, it is to be regarded as a forest park rather than as a regular forest reserve. But for purposes of administration it can best be handled if set apart under the Board of Agriculture and Forestry.

“The second area proposed to be included in the reserve is located further up the road at 29 Miles, a small block of forest, of seven and a half acres, that I believe should also

be reserved, say as Section B of the Olaa forest park. This is the stand of *koa* trees nearly opposite Mr. W.H. Shipman's mountain place, that was held out of the "Olaa Summer Lots" subdivision as a special "*koa* reserve." This *koa* grove is an interesting feature of the Volcano road. As the trees grow older it will be of interesting value as a part of the park.

Volcano Road Strips.

While this matter is under consideration by the board, I should like to bring forward one more suggestion which may result in increasing the area of the proposed forest park. I bring it up separately, as it involves a question of policy.

When the original Olaa tract was laid out, narrow strips of forest were reserved along the Volcano road between the twelve and the twenty-four mile posts, with the idea of preserving the forest, just as is now proposed on a smaller scale. Unfortunately the strips were not made wide enough. When the land behind them was opened up many of the trees on the strips died. The result was that below about the eighteen-mile post the former "forest reserve" strips are now merely remnants of open land, which are now and for years have been subject to trespass; sources of annoyance to all concerned.

Mauka of the "Peck Road" at eighteen miles there is still a fair [page 279] stand of forest on some of the strips, increasing in density toward and above Glenwood. But even where the native trees have pretty much gone there exists here, should the board deem it wise to take advantage of it, good opportunity for the planting in their stead of introduced trees of suitable species.

At present the government probably has no funds that it would care to use for such work, but in time conditions may so change as to make such planting possible. For this reason it seems to me desirable that these remnants be added to and set apart as portions of the Olaa forest park.

The Board of Agriculture and Forestry has, of course, no authority or control over these strips, nor voice as to their disposition, other than as a matter of general government policy. As concerns those below eighteen miles, my personal recommendation as superintendent of forestry is that they no longer be held for forest purposes, but disposed of under the law, as the Department of Public Lands may see fit, as agricultural land. Below eighteen miles the original forest is gone. The strips there can in my judgment be used to better advantage for agriculture than for tree planting.

I believe it would be good business for the government to clean up in this way what is now an unsatisfactory land muddle.

For the reason set forth I do therefore now recommend that the board approve the project of setting apart as the Olaa forest park reserve the three sections of government land above described, and that the board request the Governor to take the necessary steps to have the lands so set apart.

Very respectfully,

RALPH S. HOSMER,
Superintendent of Forestry.
[Hawaiian Forester and Agriculturalist, 1914:280]

1914

***Proclamation of Forest Reserve In the District of Puna,
Island and County of Hawaii, Territory of Hawaii.***

Under and by virtue of the authority vested in me by the provisions of Chapter 28 of the Revised Laws of Hawaii, as amended by Act 65 of the Session Laws of 1905, and by Act 4 of the Session Laws of 1907, and of every other power me hereunto enabling, I, Lucius E. Pinkham, Governor of Hawaii, with the approval of a majority of the Board of Commissioners of Agriculture and Forestry, having held the hearing of which notice has been duly given as in said Acts provided, do hereby set apart as a forest reserve to be called the Olaa Forest Park Reserve, those certain pieces of government land in the District of Puna, Island and County of Hawaii, Territory of Hawaii, which may be roughly described as the remaining area of government land along the Volcano Road under a stand of heavy Hawaiian forest, and containing an area of 531 acres, more or less, more particularly described by and on maps made by the government survey department of the Territory of Hawaii, which said maps are now on file in the said survey department marked Government Survey Reg. Maps Nos. 2250, 2411 and 2577 and "Olaa Forest Park Reserve," Sections A, B, and C respectively, and descriptions accompanying the same in two parts numbered C.S.F. 2538 and 2544 (the description of Section C, the road strips, appearing directly on Map No. [page 282] 2577), which said descriptions now on file in the said Survey Office are as follows:

***OLAA FOREST PARK RESERVE.
Olaa, Puna, Hawaii.***

Section A.

Including Lots 363, 364, 377, 378, 389, 390, 391, and portions of Lots 379 and 380, of the Olaa Reservation Lots.

C.S.F. No. 2538.

Beginning at the East corner of Lot 365 of the Olaa Reservation Lots (Grant 4345 to E.G. Hitchcock) at the junction of 30-foot side road with the Volcano Road, the coordinates of which point are 47,311.24 feet South and 37,490.65 feet West of Government Survey Trig. Station "Olaa," as shown on Government Survey Registered Map No. 2250, and running by true azimuths:

1. 304° 12' 2975.0 feet more or less across Volcano Road and along the Southwest side of a 30-foot road to a point in middle of old Volcano Road;
Thence along the land of Keaau along the middle of the old Volcano Road, the direct azimuths and distances being:
2. 55° 15' 2720.0 feet more or less;
3. 39° 20' 1477.0 feet more or less;
4. 63° 00' 930.0 feet more or less;
5. 124° 12' 4905.0 feet more or less along the Northeast side of a 30-foot side road, across the Volcano Road to the West corner of Lot 389 of the Olaa Reservation Lots;
6. 214° 12' 1200.0 feet along Lot 1 of the Brughelli Settlement Association lots;
7. 304° 12' 561.0 feet along Right of Purchase Lease No. 155 to Mrs. B. Bergstrom (Olaa Reservation Lots);
8. 249° 45' 976.0 feet along Right of Purchase Lease No. 155 to Mrs. B. Bergstrom (Olaa Reservation Lots);

9. 304° 12' 2689.0 feet along Right of Purchase Lease No. 155 to Mrs. B. Bergstrom (Olaa Reservation Lots) to the Volcano Road;
10. 211° 49' 430.0 feet along the Northwest side of the Volcano Road to the North corner of the Volcano Road and a 30-foot side road;
11. 124° 12' 150.0 feet along the Northeast side of a 30-foot side road to the South corner of Grant 4547;
12. 211° 49' 601.0 feet along Grant 4547 to Mrs. J.C. McStay;
13. 304° 12' 150.0 feet along Grant 4547 to Mrs. J.C. McStay;
14. 211° 49' 400.0 feet along Grant 4547 to Mrs. J.C. McStay along the Northwest side of Volcano Road;
15. 124° 12' 150.0 feet along Grant 4547 to Mrs. J.C. McStay;
16. 211° 49' 200.0 feet along Grant 4547 to Mrs. J.C. McStay;
17. 124° 12' 309.0 feet along Grant 4547 to Mrs. J.C. McStay to the South corner of Grant 4345 to E.G. Hitchcock;
18. 214° 12' 801.0 feet along Grant 4345 to E.G. Hitchcock;
19. 204° 12' 213.0 feet along Grant 4345 to E.G. Hitchcock;
20. 211° 50' 400.0 feet along Grant 4345 to E.G. Hitchcock to the point of beginning;
Area, 380 acres, more or less.

Excepting and reserving there from that portion of the Volcano Road passing through this tract (area, 6 acres), leaving a net area of 374 acres, more or less.

SECTION B.

Being the Koa Grove Reservation in the Olaa Summer Lots Subdivision.

C.S.F. No. 2544

Beginning at the West corner of the Volcano Road and Kalanikoa Road, [page 283] the coordinates of which point referred to Government Survey Trig. Station "Kulani" are 34,351.6 feet South and 20,278.6 feet East, as shown on Government Survey Registered Map No. 2411, and running by true azimuths:

1. 50° 98' 310.0 feet along new line of the Volcano Road;
2. 33° 04' 245.8 feet along new line of the Volcano Road;
3. 149° 31' 707.7 feet along the land of Keauhou to an *ohia* post;
4. 239° 31' 525.9 feet along Lot 2, Block C, of the Olaa Summer Lots (Grant 5645 to Thos. E. Cook), to an *ohia* post;
5. 329° 31' 547.6 feet along Kalanikoa Road to the point of beginning.
Area, 7 32/100 acres.

AREAS.

Section A-	374	acres
Section B-	7.32	acres
Section C-	<u>150</u>	<u>acres</u>
	531.32	acres

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Great Seal of the Territory of Hawaii to be affixed. Done at the Capitol in Honolulu this 20th day of August, A.D. 1914.

Lucius E. Pinkham
Governor of Hawaii... [Hawaiian Forester and Agriculturalist, 1913:284]

1918
Olaa Forest Reserve.

Honolulu, Hawaii, Nov. 26, 1918.
Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN :

I have the honor to recommend the setting apart as a forest reserve of a portion of the government land of Olaa, Puna, Hawaii, consisting of 20,030 acres, more or less, as shown on the attached blueprint map.

The whole area is covered with a heavy forest of native trees such as the *ohia*, *olapa*, *koa*, *loulou* palm and tree ferns with their accompaniment of a heavy undergrowth of ferns and vines and is situated between the Upper Waiakea Forest Reserve on the north, the Upper Olaa Forest Reserve on the west, and Section A of the Olaa Forest Park Reserve and homestead lots on the south. It includes a vast wilderness of heavy forest, situated between the elevations of 1700 and 3800 feet, which is impenetrable except for the roads and trails which have been cut through it.

Over fifteen years ago the tract was surveyed into homestead lots with the idea that they would be settled upon by coffee planters. Coffee cultivation was a failure here owing to the [page 492] shallowness of the soil and other unfavorable factors, and although homesteads have repeatedly been taken up in this region and a lot of money spent in improving them, no one has' been successful in raising any crops.

With this demonstration in view, and with the idea of making some use of the land, four leases have been made during the past two years by the Land Office of a part of the land at the lower or *makai* end, consisting of a total of 8,886 acres, at nominal rentals, with the idea that cattle could be raised on the land. All of these leases are held by Japanese, who are about the only people who will live in this wet region. In connection with one of these leases, the largest, consisting of 8589 acres, portions of the land have been subleased to four other Japanese. These men are making an unsuccessful attempt at raising a few head of scrubby cattle in the forest. At the time the first lease was assigned to a second party in April, 1918. 175 head of cattle were supposed to have been turned over with the lease, but on account of the heavy growth of forest the assignees have been able to find only 100 head.

Recently an application was made for a lease of the balance of this forest land for grazing purposes, but at my request the application has been held up. If further extended grazing is permitted on the land it will, in time, become similar to adjacent lands *makai*—a useless waste of dead trees, fallen logs and Hilo grass. Such a large stretch of forest cannot help but exert a favorable influence on the surrounding climate, and this is of importance to the Olaa Sugar Plantation just below, which suffered from the effects of drought two summers ago.

As stated above, the soil throughout the region for the most part is shallow and is best suited to forest growth. Continued grazing in the region on any scale will in time reduce the forest to a useless waste.

Sufficient land has been left out of the area recommended to be set aside to provide for the need of additional homesteads at the *makai* or lower end where soil conditions are more favorable, and a sufficient area at the high elevation near the upper end, not far from the Volcano House, has been reserved for additional summer lots.

For the reasons above set forth, I recommend that the Board approve the project of creating the Olaa Forest Reserve, as described above, and that the Governor be requested to take the necessary steps toward this end.

Respectfully submitted,
C. S. JUDD,
Superintendent of Forestry. [Hawaiian Forester and Agriculturalist, 1918:493]

Withdrawal of Land From Olaa Forest Park Reserve.

Honolulu, Hawaii, Nov. 27, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:

I have the honor to submit, as follows, a report recommending the withdrawal of 30,000 square feet or 0.69 acres of land from a part of Section C of the Olaa Forest Park Reserve on the Volcano Road above Glenwood, in Olaa, Puna, Hawaii, for the purpose of exchange with Mr. F. G. Snow for an equal area of privately owned forest land in the immediate vicinity which it is desired to include in the above reserve. The two areas, each 200 feet by 150 feet in size, are shown on the attached maps.

This section of the Olaa Forest Park Reserve, which was set aside on August 20, 1914, consists of narrow strips of land, only 150 feet deep, fronting on both sides of the Volcano Road. On some of the homestead lots these reserve strips occupy most of the frontage and in some cases have caused great inconvenience.

In this case, the piece desired by Mr. Snow is opposite his frontage area across the road, and he desires to use it as a driveway between his two opposite lots. There is only a scant covering of dying tree ferns and dead *ohia* trees on this piece, whereas on the piece of equal size which he desires to give the government in exchange, and which is already protected by a fence, there is a heavy forest of *ohia* and tree ferns in good condition.

The government will thus benefit by the exchange and, for this reason, I recommend that the Board approve the withdrawal of the 30,000 square feet and that the Governor be requested to take the necessary further action to perfect the exchange.

Respectfully submitted,
C. S. JUDD, Superintendent of Forestry. [Hawaiian Forester and Agriculturalist, 1918:494]

***Proclamations of Forest Reserve in the District of Puna,
Island and County of Hawaii, Territory of Hawaii.***

Under and by virtue of the authority vested in me by the provisions of Chapter 37 of the Revised Laws of Hawaii of 1915, and of every other power me hereunto enabling, I C.J. McCarthy, Governor of Hawaii, with the approval of a majority of the Board of Commissioners of Agriculture and Forestry, having held the hearing of which notice has been duly given as in said laws provided, do hereby set apart as a forest reserve to be called the Olaa Forest Reserve, subject to existing rights, a portion of that certain piece of government land called Olaa, in the District of Puna, Island and County

of Hawaii, Territory of Hawaii, containing an area of 20,030 acres, more or less, more particularly described by and on maps made by the Government Survey Department of the Territory of Hawaii, which said maps are now on file in the said Survey Department marked Government Survey Reg. Map No. 2250 and "Olaa Forest Reserve" and description accompanying the same number C.S.F. 3026, which said description now on file in said Survey Department, is as follows:

Olaa Forest Reserve.

Portion of the Government Land of Olaa, Olaa, Puna, Hawaii.

C.S.F. 3026

Beginning at the West corner of this reserve, and the North corner of UPPER OLAA FOREST RESERVE, the true azimuth and distance from Government Survey Trig. Station "Kulani" being 243° 20' 12,694 feet, as shown on Government Survey Registered Map No. 2250, and running by true azimuths:

1. 243° 20' 50,151.7 feet along WAIAKEA FOREST RESERVE;
2. 318° 39' 30" 1848.9 feet along government land;
3. 48° 39' 30" 12,070.0 feet along Lots 229 to 214 inclusive, Olaa New Tract, to the West corner of Lot 214;
4. 38° 41' 50.5 feet across Road No. 2, to the North corner of Lot 213, Olaa New Tract;
5. 48° 32' 30" 3010.9 feet along Lots 213 to 210 inclusive, Olaa New Tract, to the West corner of Lot 210;
6. 138° 32' 30" 724.9 feet along Lot 264, Olaa New Tract;
7. 48° 32' 30" 3055.0 feet along Lot 264, Olaa New Tract, and across Road No. 3, to the North corner of Lot 265, Olaa New Tract;
8. 318° 32' 30" 6583.2 feet along West side of Road No. 3 to the North corner of Lot 119A, Olaa New Tract;
9. 48° 32' 33" 18,130.0 feet along Lots 119A, 118, 117, 116, 115, 120, 121, 129 and 130, Olaa New Tract, and across Road No. 6, to the East corner of Lot 53, Olaa New Tract;
10. 318° 32' 30" 3.6 feet along Southwest side of Road No. 6:
11. 302° 21' 5759.2 feet along Southwest side of Road No. 6, to the North corner of Lot 99, Olaa New Tract;
12. 34° 08' 30" 11,016.5 feet along Lots 99 to 85 inclusive, Olaa New Tract;
13. 318° 32' 30" 2998.0 feet along Lot 85, Olaa New Tract;
14. 34° 08' 30" 384.0 feet, more or less, along Northwest side of a road;
15. 304° 12' 5539.0 feet, more or less, across road, and along the Southwest side of a 30-foot road;
16. 214° 12' 1230.0 feet across a 30-foot road, and along Lot 387, Olaa Reservation Lots; [page 505]
17. 304° 12' 2069.0 feet along Lots 380 and 381, Olaa Reservation Lots;
18. 34° 12' 1230.0 feet along OLAA FOREST PARK RESERVE and across a 30-foot road;
19. 304° 12' 3930.0 feet, more or less, along Southwest side of a 30-foot road, to the West corner of said 30-foot road and Volcano Road;

20. Thence along the Northwest side of Volcano Road, the direct azimuth and distance being: 45° 10' 1644.0 feet, more or less;
 21. 149° 16' 602.7 feet along government land;
 22. 88° 00' 573.7 feet along same;
 23. 117° 47' 1244.6 feet along same;
 24. 134° 18' 507.3 feet along same;
 25. 69° 01' 860.7 feet along same;
 26. 87° 39' 911.9 feet along same;
 27. 87° 35' 421.9 feet along same;
 28. 87° 55' 400.2 feet along same;
 29. 57° 22' 424.1 feet along same;
 30. 160° 31' 30" 213.3 feet along same, and across Kilauea Road to the South corner of Lot 2B, Brughelli Settlement Association;
 31. 59° 31' 13,218.0 feet along the Northwest side of Kilauea Road, to the North corner of said Kilauea and Hinano Roads;
 32. 149° 31' 15,000.0 feet along the Northeast side of Hinano Road, and along the Kilauea Settlement Association Lots and UPPER OLAA FOREST RESERVE;
 33. 239° 31' 5858.0 feet along UPPER OLAA FOREST RESERVE;
 34. 329° 31' 3000.0 feet along same;
 35. 239° 31' 4492.0 feet along same;
 36. 138° 32' 30" 26,210.0 feet along UPPER OLAA FOREST RESERVE, to the point of beginning.
- Area, 20,030.0 acres, more or less.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Great Seal of the Territory of Hawaii to be affixed.

Done at the Capitol in Honolulu, this 31st day of December, A.D. 1918.

C.J. McCarthy
Governor of Hawaii.
By the Governor:

Curtis P. Iaukea,
Secretary of Hawaii. [Hawaiian Forester and Agriculturalist, 1918:506]

***Proclamation of Withdrawal of Certain Land From
the Olaa Forest Park Reserve, District of Puna,
Island and County Of Hawaii, Territory Of Hawaii.***

UNDER and by virtue of the authority vested in me by the provisions of Chapter 37 of the Revised Laws of Hawaii of 1915, and of every other power me hereunto enabling I, C.J. McCarthy, Governor of Hawaii, with the approval of a majority of the Board of Commissioners of Agriculture and Forestry, having held the hearing of which notice has been duly given all as in said laws provided, do hereby withdraw and eliminate from Section C of the Olaa Forest Park Reserve, in the District of Puna, Island and County of Hawaii, Territory of Hawaii, created and set apart by the Proclamation of the Governor of Hawaii on August 20, 1914, that certain portion of the government land called Olaa, containing 30,000 square feet, in the District of Puna, Island and County of

Hawaii, [page 506] Territory of Hawaii, more particularly described by and on maps made by the Government Survey Department of the Territory of Hawaii, which said maps are now on file in the said Survey Department marked Government Survey Reg. Map No. 2577 and "Territory of Hawaii to F.G. Snow, Portion of the Forest Reserve Between the Volcano Road and Lot 328 of the Olaa Reservation Lots," and a description accompanying the same numbered C.S.F. 3027, which said description now on file in the said Survey Department is as follows:

TERRITORY OF HAWAII TO F.G. SNOW,

Portion of the Forest Reserve between the Volcano Road and Lot 328, of the Olaa Reservation Lots, Olaa, Puna, Hawaii.

C.S.F. 3027.

Beginning at the South corner of this piece, on the Northwest side of Volcano Road, said point being 214° 12' 660.8 feet from the North corner of Volcano Road and a 30-foot side road, the coordinates of said point of beginning referred to Government Survey Trig. Station "Olaa" being 42,654.0 feet South and 34,468.3 feet West, as shown on Government Survey Registered Map No. 2577, and running by true azimuths:

1. 124° 12' 150.0 feet along Forest Reserve (government land);
2. 214° 12' 200.0 feet along Lot 328, Olaa Reservation Lots;
3. 304° 12' 150.0 feet along Forest Reserve (government land);
4. 34° 12' 200.0 feet along Volcano Road to the point of beginning.
Area, 30,000 square feet.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Great Seal of the Territory of Hawaii to be affixed.

Done at the Capitol in Honolulu, this 31st day of December, A.D. 1918.

C.J. McCarthy
Governor of Hawaii.

By the Governor:
Curtis P. Iaukea,
Secretary of Hawaii. [Hawaiian Forester and Agriculturalist, 1918:507]

Pu'u Kūlani and Vicinity Described in 1919

Botanist, Joseph Rock described the make up of the forest around Pu'u Kūlani, as it existed in 1919. Interestingly, at that time, he called for fencing as a means of protecting the unique biological system from depredation of wild cattle and pigs:

***One Government Forest
Reserve Lands at Kulani, Hawaii, Described.***
By Joseph F. Rock, Consulting Botanist.

The whole forest reserve area at Kulani, Hawaii, is covered with a decidedly uniform and, geologically speaking, rather young forest. The border below 29 Miles contains more of a mixture of trees than the area further up toward Kulani proper. Near 29 Miles we find that trees are more numerous, especially *ohia* lehuas with occasional *mana* [*maua*] trees, *Xylosma Hillebrandii*, of which the writer encountered large individuals.

Dispersed throughout that region is a very beautiful native fan palm with large orbicular fruits described by the writer as a new species under the name of *Pritchardia Beccariana*. *Olapa*, *Cheirodendron*, *Gaudichaudii*; an occasional *aiea*, *Nothocestrum*; *kopiko*, *Straussia*; *olomea*, *Perrottetia*; *pilo*, *Coprosma*; and *manono*, *Gouldia*, form the rest of the arborescent growth.

The forest is, however, mainly a tree-fern forest interspersed with an occasional tree of the species mentioned. An acre of this forest land may contain perhaps five or six mature trees, of which four may belong to the genus *Metrosideros* (*ohia lehua*). The remainder is all tree ferns composed of the two common types—*Cibotium Chamissoi* and *Cibotium Menziesii*. Undergrowth is mainly composed of *Cyrtandrae*, *Broussaia*, [page 39] *Cyanea tritomantha*, *Cyanea pilosa*, *Rubus*, *Phyllostegia*, etc. Ferns are of course very numerous. The whole forest is in splendid condition, but the undergrowth is much disturbed by the ravages of wild pigs. The uniformity of the forest makes exploring rather uninteresting for a botanist.

Kulani proper is a densely wooded volcanic cone, the forest being exceedingly uniform and of the rain forest type. Palms are entirely absent. A gap was cut at the summit to permit a view of the surrounding region. The land toward Keauhou lies considerably lower than that over which Kulani was approached, or, in other words, the slopes of Kulani towards Keauhou are rather steep, giving the cone quite a formidable appearance both in height and size. The summit appears as two cones, but in fact the central valley or ridge, densely wooded, is nothing but an ancient volcanic fissure dividing the cone in two. The ground is covered with fallen trunks of both trees and tree-ferns which are covered with numerous epiphytes such as ferns *Stenogyne*, *Clermontia parviflora*, *Astelia veratroides*, *Selagruella*, *Lycopodium*, etc. The soil is mostly black loam, and the ground quite hummocky, which, besides fallen trunks and the absence of a trail, made progress quite slow. If properly fenced and protected from cattle and wild hogs, this forest reserve is certainly one of the finest on Hawaii, and deserves protection from cattle and hogs. [Hawaiian Forester and Agriculturalist, 1919:40]

The Waiākea Forest Lands

Following the development of the Hilo Forest Reserve in 1904, and the addition of portions of the Ōla'a Tract to the reserve system in 1905 and 1913, the board also set aside the upland portions of Waiākea as a reserve. Thus, making a contiguous line of forest across the Hilo District, and adjoining the Puna District. The following documents are among those recorded as a part of the dedication of the Waiākea forest lands to the reserve system.

Honolulu, June 6, 1913.

The Upper Waiakea Forest Reserve.

Reports of the Superintendent of Forestry.

Gentlemen:—

I have the honor to submit as follows the recommendation that a forest reserve be created to cover the central forested portion of the government land of Waiakea, district of Hilo, island and county of Hawaii:

Location, Object and Area.

Waiakea is a large government land stretching from the sea at Hilo bay well up on the slopes of Mauna Loa. Much of the lower portion is in cane; the extreme upper part is more or less open grazing land, crossed by lava flows. Between is a section of heavy forest. The present recommendation is that the forested portion be set apart as a forest reserve, with the objects (1) of bringing the land under the management of the department of the Territory especially equipped to care for it, so that (2) it may be

wisely administered in any way not inconsistent with its maintenance as a forest that may in the future be deemed best. [page 302]

Owing to the geological formation of the island of Hawaii there are no running streams south of the 1855 and 1881 lava flows that come down the side of Mauna Loa back of Hilo town on lands lying immediately to the north of Waiakea. It is quite possible that springs and water holes may later be discovered in the Waiakea forest; for at present almost nothing is known accurately about the interior of this tract; but there are no running streams coming from it.

The question of stream protection does not, therefore, figure on Waiakea, but there are other reasons why it is important that existing areas of forest should receive the care and protection of the government. Until many more scientific data than are now available have been collected, it is impossible to tell how far-reaching may be the influence exerted on the country immediately surrounding large bodies of continuous forest, but it is evident that such influence does exist and that it is beneficial. Particularly is this true in the tropics and sub-tropics.

Further, on Waiakea it may happen that in time the question may arise of devoting portions of this forest to commercial utilization. To safeguard the interests of the government in all these ways and to be ready for any sort of development that may come about, it is desirable that the Waiakea forest become the Waiakea forest reserve.

The area proposed to be set apart is 51,800 acres. Of this 600 acres is a part of the land of Piihonua, a remnant mainly covered with lava, between the boundaries of the Hilo forest reserve and Waiakea. Piihonua is now under lease No. 103 to Hon. John T. Baker, expiring on March 21, 1921.

At the present time all of the land of Waiakea is under an expiring 30-year lease to the Waiakea Mill Co. (No. 124) that runs out on June 1, 1918. No use is at present made of the forest. Beyond the general clause against waste, common to the leases of that time, the lessees are not obligated to protect the forest.

The forest on Waiakea is practically unexplored region. It is a dense stand of the rain-forest type. *Ohia-lehua* is the predominating tree. Along its lower side, where the forest is crossed by the Olaa flume, are numerous groups of *loulou* palms, growing in company with great tree ferns. And throughout, so far as the interior is known, there is a dense stand of the undergrowth characteristic of this type of Hawaiian forest.

Boundaries.

The upper and lower boundaries of the proposed Upper Waiakea forest reserve have been somewhat arbitrarily fixed by drawing lines across the land from known points on the outside boundaries, but it is believed that they serve the purpose at this time as well as if they had been run out on the ground. The *makai* line very nearly parallels the flume constructed to carry water [page 303] from upper Kaumana to the Olaa plantation. The upper line leaves out of the reserve the area suitable for grazing above the native forest.

The elevation of the *makai* boundary is approximately 1800 feet; that of the *mauka* line varies from 5000 feet at Puu Kulani to 4500 feet at the 1855 lava flow, where the proposed reserve joins and forms a continuation of the existing Hilo forest reserve.

Description.

A technical description of the boundary, prepared by the Government Survey Office as C.S.F. 2430, accompanies this report.

Recommendations.

For the reasons above set forth I do now recommend that the Board approve this project and call upon the governor of the Territory to set apart this government land as a forest reserve to be known as the Upper Waiakea forest reserve.

Very respectfully,

RALPH S. HOSMER

Superintendent of Forestry. [Hawaiian Forester and Agriculturalist, 1913:304]

1913

***Proclamation of Forest Reserves in the Districts of
Hilo and Puna, Island and County of Hawaii, Territory Of Hawaii.***

UNDER and by virtue of the authority vested in me by the provisions of Chapter 28 of the Revised Laws of Hawaii, as amended by Act 65 of the Session Laws of 1905, and by Act 4 of the Session Laws of 1907, and of every other power me hereunto enabling, I, Ernest A. Mott-Smith, Acting Governor of Hawaii, with the approval of a majority of the Board of Commissioners of Agriculture and Forestry, having held the hearing of which notice has been duly given as in said Acts provided, do hereby, subject to the existing leases, SET APART as forest reserves, to be called respectively the Upper Waiakea Forest Reserve and the Upper Olaa Forest Reserve, those certain pieces of government land in the Districts of Hilo and Puna, Island and County of Hawaii, Territory of Hawaii, which may be described roughly as being the block of native forest on the lower slopes of Mauna Loa lying above the agricultural land back of Hilo and to the north and west on the various Olaa homestead subdivisions, and containing, respectively, areas of 51,800 acres and 9280 acres, more or less, more particularly described by and on a map made by the Government Survey Department of the Territory of Hawaii, which said map is now on file in the said Survey Department marked Government Survey Reg. Map No. 1808, and "Upper Waiakea" and "Upper Olaa Forest Reserves," and descriptions accompanying the same, numbered respectively C.S.F. Nos. 2430 and 2476, which said descriptions, now on file in the said Survey Department, are as follows:

UPPER WAIAKEA FOREST RESERVE

Portions of the Government lands of Piihonua and Waiakea,
District of Hilo, Island of Hawaii.
C.S.F. No. 2430.

Beginning at the Government Survey Trig. Station "Kulani" at the intersection of the lands of Olaa, Keauhou, and Waiakea, as shown on Government Survey Reg. Map No.1808, and running by true azimuths:

1. 162° 58' 56,790 feet, more or less, along the land of Waiakea to a point at lower Mawae, near a small island in lava flow; [page 332]
2. Thence along the HILO FOREST RESERVE along edge of lava flow of 1855 to the Northwest corner of the Land of Punahoa 2nd, the direct azimuth and distance being: 256° 27' 33,580.0 feet, more or less;
3. 341° 00' 7000 feet, more or less, along the land of Punahoa 2nd;
4. 93° 20' 5230.0 feet, more or less, along the land of Kaumana;
5. 1° 00' 640.0 feet, more or less, along the land of Kaumana;
6. 29° 30' 2750 feet, more or less, along the land of Kukuau 2nd;

7. 350° 00' 1150 feet, more or less, along the land of Kukuau 1st to a point a little South of the lower end of a small branch of the lava flow of 1855 at a place called Kapualei;
 8. 285° 30' 24,500 feet, more or less, along the land of Kukuau 1st;
 9. 309 ° 21' 26,710.0 feet, more or less, across the land of Waiakea to the North corner of Lot 232 of the Olaa New Tract Lots ;
 10. 63° 20' 62,845.7 feet, more or less, along the Olaa New Tract Lots, and the Land of Olaa to the point of beginning.
- Area, Waiakea, 51,200 acres; Piihonua, 600 acres. Total area, 51,800 acres...
[Hawaiian Forester and Agriculturalist, 1913:333]

In 1923, the boundaries of the Upper Waiakea Forest Reserve were modified, by survey of 1922, and recorded in C.S.F. 3876:

C.S.F. 3876
Upper Waiakea Forest Reserve,
South Hilo, Hawaii.
(revised)

June 13, 1922

Including the upper portion of the land of Waiakea [see *Figure 3*].

Beginning at "Kulani", a Government Survey Triangulation Station, at the South corner of the land of Waiakea and the Northwest corner of the land of Olaa, and on the East boundary of the land of Keauhou, and running by true azimuths:—

1. 133° 18' 05" 19346.9 feet along the land of Keauhou to a spike in large upright stone near Kipu Hill;
 2. 159° 33' 17" 49478.2 feet along the lands of Keauhou and Humuula to "Kahiliku Boundary" Point;
 3. 288° 24' 33" 15744.0 feet along the land of Piihonua to "Mawae" Trig. Station;
 4. 271° 41' 28484.0 feet along same;
 5. 4° 33' 30" 535.0 feet along the land of Kaumana;
 6. 52° 30' 2750.0 feet along the land of Kukuau 2nd;
 7. 340° 25' 1150.0 feet along the land of Kukuau 1st;
 8. 284° 51' 27258.0 feet along same;
 9. 308° 23' 24802.0 feet along Waiakea Forest Reserve;
 10. 63° 20' 62845.7 feet along Olaa and Upper Olaa Forest Reserves to the point of beginning.
- Area 63,150 Acres.

Excepting and Reserving there from the following Tracts or parcels of land, to-wit:—

Part 1, Portion of Waiakea. Beginning at a point called "Kahiliku Boundary", on the boundary of Humuula, Waiakea and Piihonua, the direct azimuth and distance of said point of beginning from Government Survey Trig. Station "Puu Oo" being 355° 40' 55" 16092.7 feet, and running by true azimuths:—

1. 288° 24' 33" 7500.0 feet along Piihonua;
2. 83° 00' 6005.0 feet;
3. 159° 33' 17" 3309.0 feet along Humuula-Waiakea boundary to the point of beginning.

Area 222-00/100 Acres.

Part 2. Portion of Aina Hou Kipuka in Waiakea. Beginning at a point on the Humuula-Waiakea boundary, the coordinates of said point of beginning referred to Government Survey Trig. Station "Puu Oo" being 21021.4 feet South and 3081.3 feet East, and running by true azimuths:—

1. 268° 00' 3500.0 feet;
2. 59° 00' 3370.0 feet;
3. 159° 17' 33" 1725.0 feet to the point of beginning.

Area 66-00/100 Acres.

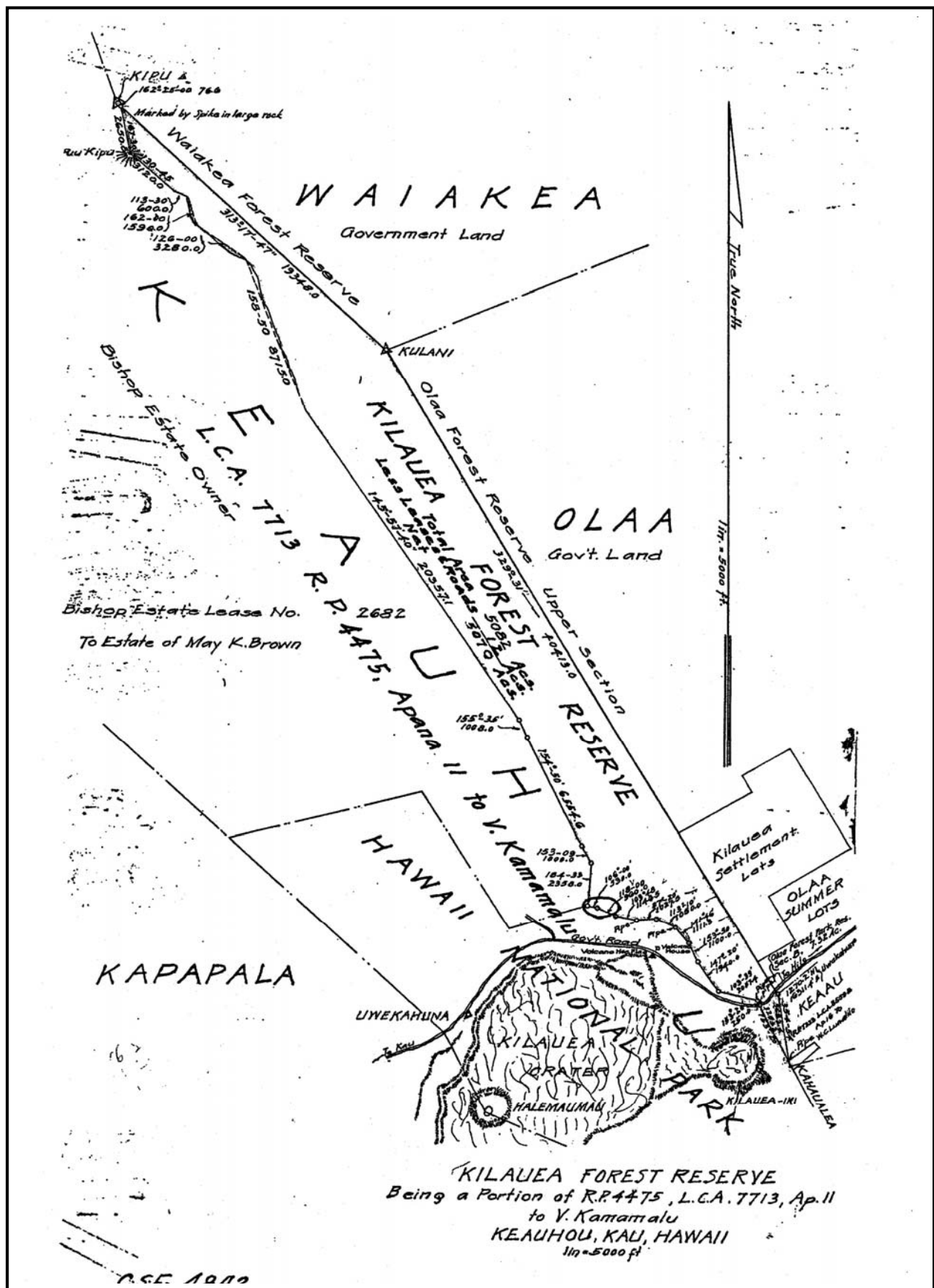
LEAVING A NET AREA OF 62,862 ACRES.

Compiled from Gov't. Survey Records & Survey of E.W. Hockley, by A.S. Chaney, Assistant Government Surveyor. [State Survey Division]

[See also Plat 788; R.M. 2682, Dated Jan. 3, 1923; and C.S.F. 2430, 3942, 9193, 16633, 21210-21213.]

The Hawaii National Park, taking in portions of Keauhou and neighboring lands in Puna, was established on August 1st, 1916. In 1926, an addition to the park, connected the Kīlauea and Mauna Loa Sections of the park (C.S.F. 4625, State Survey Division). In 1928, the Kilauea Forest Reserve, comprised of a portion of Keauhou, adjoining the 'Ōla'a and Waiākea Forest Reserve lands was established, thus extending the forest reserve tracts from Hilo, through Puna, and into Ka'ū (C.S.F. 4842) (*Figure 4*). While the land of Keauhou had been leased out to ranching interests since 1860, some control over the cattle had been maintained. The leases specifically stipulated that care would be taken of the forest resources (Bureau of Conveyances Liber 13:56-57). Apparently, based on the early records of the reserve, only minimal intrusion by wild stock into the denser 'Ōla'a-Waiākea forests occurred.

Following establishment of the 'Ōla'a, Waiākea and Kīlauea Forest Reserves, management of the lands and forest resources fell under the jurisdiction of the Territory, and then the State of Hawai'i. During the years from establishment of the reserves to the 1950s, little work occurred within the deep reserves. Some fencing along leasehold boundaries occurred, and cattle continued to be moved on the upper Humu'ula and Keauhou sections of the adjoining lands. Hunting wild cattle and pigs in the reserve lands and neighboring ranch lands was almost entirely limited to ranch hands, territorial game wardens and personnel, and the occasional poacher. It was not until after World War II ended that the Territorial Fish and Game Division began a program of conducting guided hunting trips, and developing camps from which hunters could access the public lands for hunting pigs in the region—this being a way to control damage done to the forest reserve resources.



The “Kulani Prison Farm”

One additional activity began in the forest lands in the 1940s, in the vicinity of what is now the Pu‘u Maka‘ala NAR. This was the relocation of the Waiakea Prison Camp from the Hilo Airport to the remote, Kūlani site. Howard Ellis, former employee and manager of the Mauna Loa Weather Station, began working on Mauna Loa in 1961. During the early years on Mauna Loa, Mr. Ellis was close friends with Tom Vance, who opened the Kūlani Prison Farm (later, the Kulani Honor Camp); the access roadway (Stainback Highway); and the Mauna Loa Observatory.

Government survey records document that on January 8, 1948, the lands for the Kulani Prison Site were confirmed by the survey below (*Figure 5*):

C.S.F. 10,543

January 8, 1948

Kulani Prison Site

South Hilo and Puna Island of Hawaii

Being portions of Upper Waiakea Forest Reserve and Upper Olaa Forest Reserve to be withdrawn by Governor’s Executive Order and set aside under the control of the Board of Institutions as a prison site.

Being portions of the Government (Crown) lands of Waiakea and Olaa.

Beginning at the Government Triangulation Station “Kulani” and on the common boundary of the lands of Keauhou, Waiakea and Olaa as shown on Government Survey Registered Map 2765, and running by azimuths measured clockwise from True South:-

1. 133° 18’ 05” 5000.00 feet along the land of Keauhou;
2. 180° 00’ 7500.00 feet along portion of the Upper waiakea Forest Reserve;
3. 90° 00’ 3400.00 feet along the Upper Waiakea Forest Reserve;
4. 159° 33’ 30” 9600.00 feet along Upper Waiakea Forest Reserve;
5. 105° 40’ 4500.00 feet along Upper Waiakea Forest Reserve;
6. 156° 10’ 6410.70 feet along Upper Waiakea Forest Reserve;
7. 249° 33’ 3247.00 feet along Upper Waiakea Forest Reserve;
8. 336° 10’ 3849.20 feet along Upper Waiakea Forest Reserve;
9. 285° 40’ 7500.00 feet along Upper Waiakea Forest Reserve;
10. 339° 33’ 30’ 5500.00 feet along Upper Waiakea Forest Reserve;
11. 285° 52’ 11493.30 feet along Upper Waiakea Forest Reserve;
12. 360° 00’ 800.00 feet along Upper Waiakea Forest Reserve;
13. 56° 11’ 30” feet along Upper Waiakea Forest Reserve;
14. 360°00 19300.00 feet along portions of the Upper Waiakea and Upper Olaa Forest Reserves;
15. 149° 31’ 9000.00 feet along the land of Keauhou to the point of beginnig.

Area 5,600 Acres. [State Survey Division]

Governor Ingram M. Stainback, issued Executive Order No. 1224 on March 4th, 1948, formally removing the Kulani Prison site lands from the Upper Waiakea and Olaa Forest Reserves, and setting aside the land for use by the Department of Institutions for the Kulani Prison Farm (Governor’s Executive Order No. 1224).

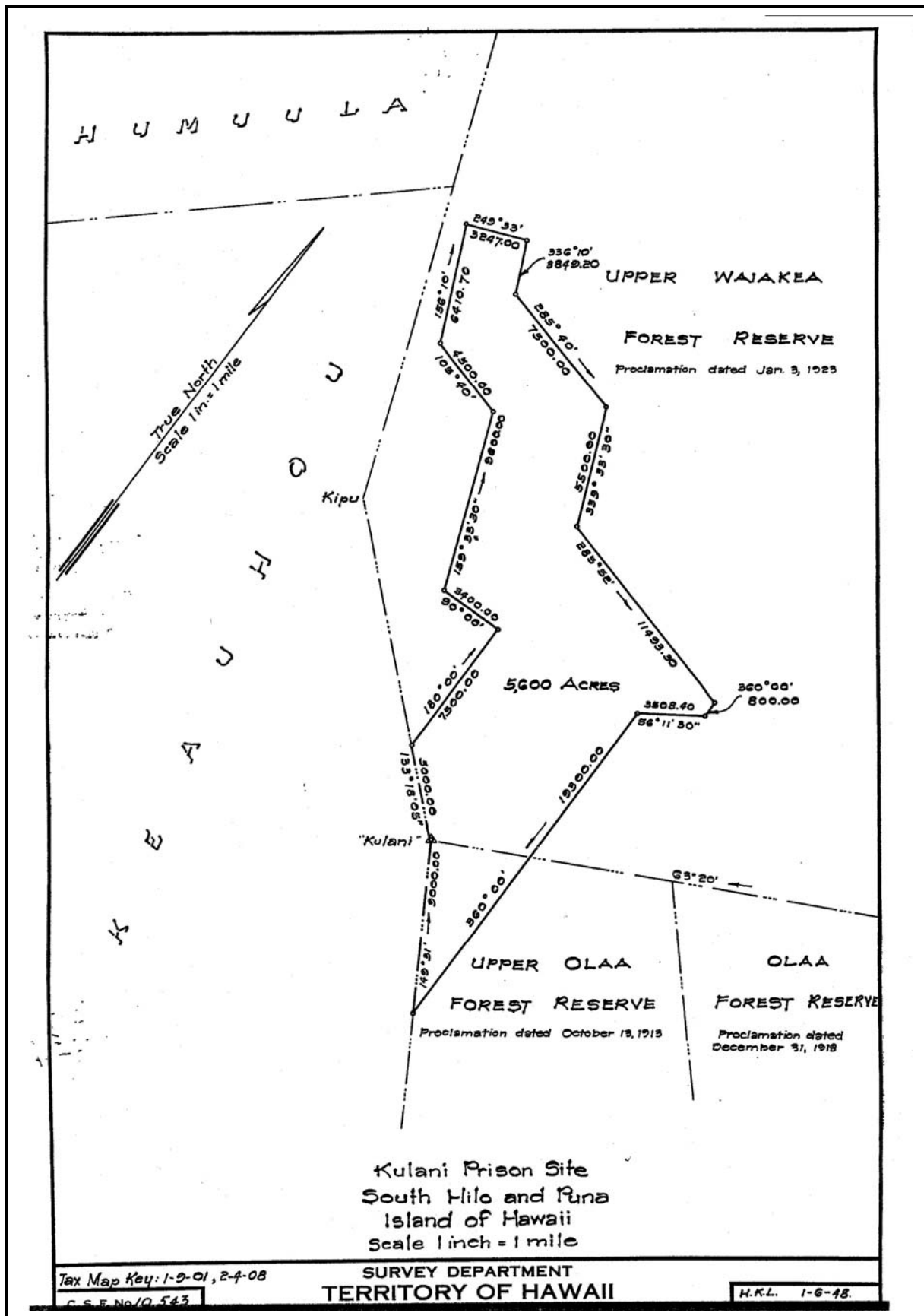


Figure 5. C.S.F. Map No. 10,543; The Kulani Prison Site (January 8, 1948)

In 1952, the Kulani Prison Farm site was modified, taking in an additional 4,461.99 acres of forest land from the Upper Waiakea and Olaa Forest Reserves. C.S.F. No. 11,550 lays out the mete and bounds and map of the addition (see *Figure 6*). Governor, S.W. King. Signed Executive Order No. 1588, on October 16th, 1953, setting aside the additional land for the facility and support programs.

From Tom Vance, Howard Ellis learned first-hand accounts about the Kūlani facility and access across the forest lands in the 1940s to 1950s (pers comm. H. Ellis, 2004). *Figure 7*, HTS Plat No. 788-A (A.S. Chaney, surveyor, dated 1922); with additions to 1956, provides the locations of sites and facilities described by Mr. Ellis, who wrote of his recollections in 1988:

In 1951, a weather station was set up by the Weather Bureau (WB) near the summit of Mauna Loa... An instrumented building was dedicated there as the Mauna Loa Observatory on December 12. [page 1] On June 28, 1956, a larger building at 11,150 feet was dedicated as the Mauna Loa Slope Observatory, which in time became known as the Mauna Loa Observatory...

Mr. Tom Vance came... to Hawaii to teach school in the 1930s... On an early hike over the trail from Puu O'o across the lower slopes of Mauna Loa on the Hilo side to the Volcano area, he dreamed that some day he would be in a position to cause the great resources he found along the trail to be utilized. He found "great ash [page 2] deposits of deep fertile soil and beautiful stands of *koa* trees, many of which were falling to the ground and slowly rotting away."

Mr. Ingram M. Stainback, a prominent attorney in the islands...helped Mr. Vance establish the Waiakea Prison Camp near Hilo for the purpose of forming an airstrip by hand labor using only picks, shovels and wheelbarrows.

When the war started, the military took over this airstrip, expanding it, making it a Navy Air Station only to realize that virtually in its center there was a prison camp... [page 3] With concern for their safety and with his philosophy that if any person is to be retrained to function in society he must be given constructive work and a chance to learn a trade, he set his sights up the slope in the direction of the summit of Mauna Loa to that area where he had seen that rich soil and huge *koa* trees. It was a long way off and partly through a rainforest. They started out packing in with each cutting the trail with a cane knife.

[Mr. Vance] ...said that people thought him crazy to do this... They finally made it to the base of the Kulani Cone where the Territorial Board of Agriculture had come in from the other side, up the Puu O'o trail from the Volcano area, and built a pig hunter's cabin to encourage the reduction of damage to the forest by pigs.

Mr. Vance had found that the territorial government's half million acres in the area they had cut through were ideal not only for forests, which could foster a lumber and furniture industry, but the mile high area provided a climate ideal for temperate zone agriculture.

He felt that as soon as the prison industry was thought to be competitive with private industry, there would be a legislation that would be passed to stop the activity. However, they [page 4] might be safe in their isolation up there, he thought. There were 17 miles of road to be built through dense jungle with little likelihood of special appropriations since it was during war time.

He began by sledding in supplies a short distance, establishing camp, working the road back down, and repeating these steps over again. Mr. Stainback had now been appointed Governor of the Territory and when the commander of the U.S. Navy

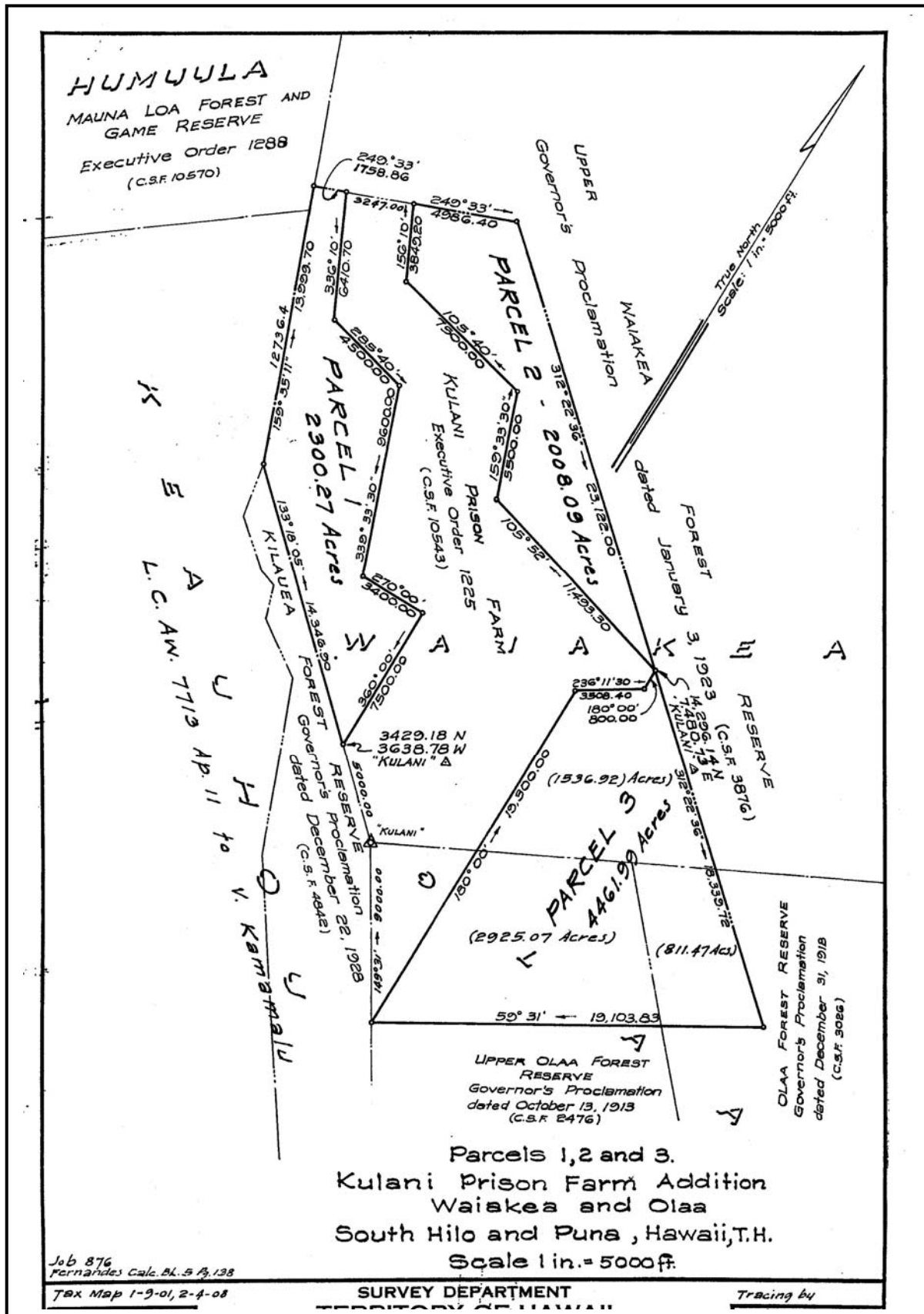


Figure 6. C.S.F. Map No. 11,550; Addition to the Kulani Prison Site (October 16th, 1953)

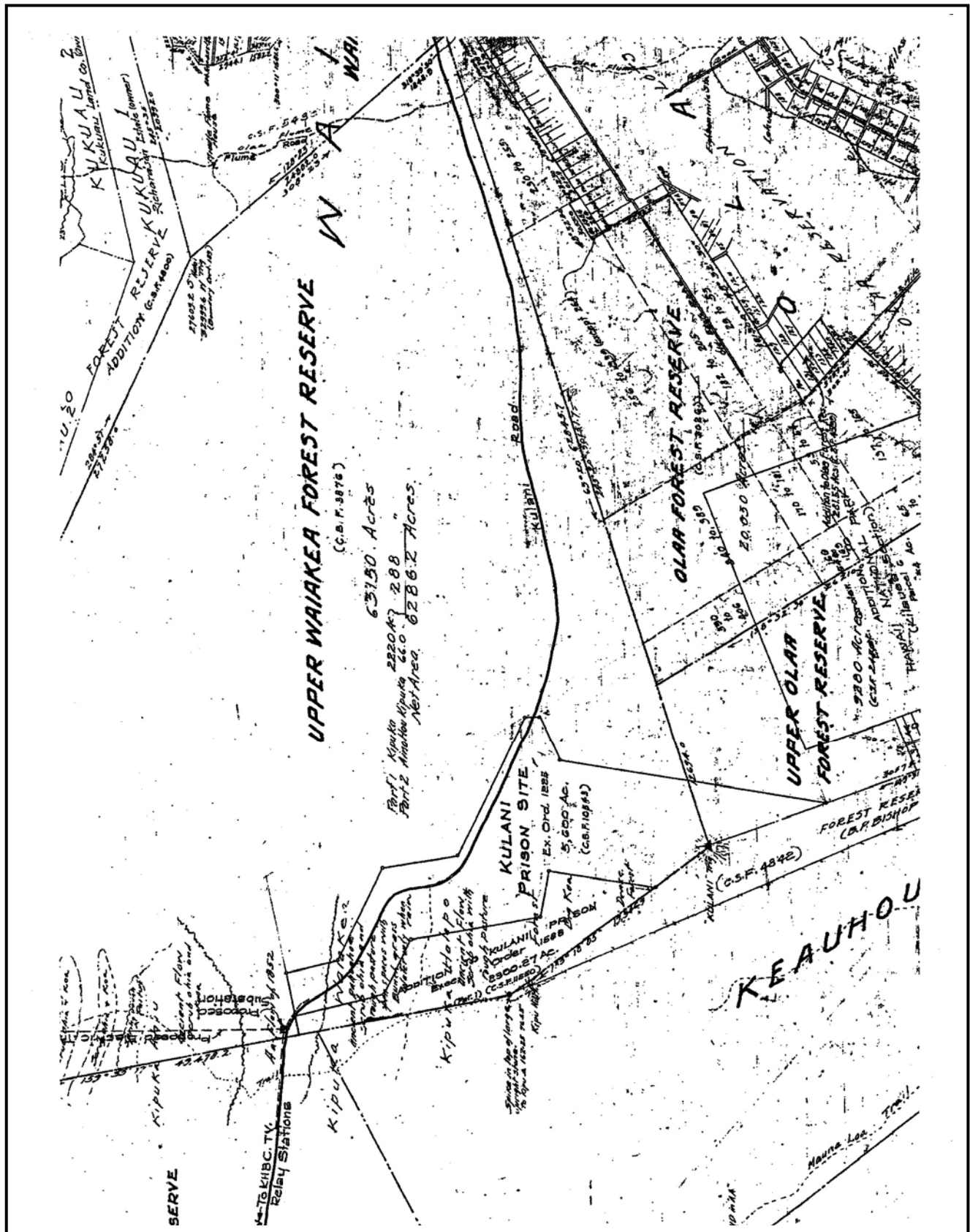


Figure 7. Portion of HTS Plat No. 788-A, Depicting Features and Boundaries of the Kulani Prison Site (A.S. Chaney, 1922; additions to 1956)

Seabees requested the use of land for practice in road building to be soon used in the war on Pacific islands and in jungles, he knew just where to send them.

Things were going great for about three miles when a big *ohia* tree fell on a bulldozer operator. He might have died but the prisoners quickly wrested the big trunk away. The Seabees gave up, but Mr. Vance didn't.

When the immediate threat of enemy landings on the island subsided, some portable barracks that had been used by guard units at various places around the island were left surplus. Mr. Vance obtained and used some of these for his camps as he continued to push up further toward Kūlani.

He had many plans and tried to tie them all together. He planned a road all the way to the summit of Mauna Loa with a median strip where he thought all the plants of the world could [page 5] find a supporting climate³. It was to be called the "Gardens of the World." The road was named "Stainback Highway," leaving it open for later jokes about "Strainback Highway."

The reason Mr. Vance gave for choosing Mauna Loa was the resources of the Kūlani area. Since Mauna Kea, at any given elevation above 6,000 feet is about five times smaller in area than Mauna Loa, and being of almost equal height, it is easier to see. With great pride, he pointed out how he had laid out the road in several places above Kūlani so as to frame Mauna Kea with his great *koa* trees on both sides of the road. His pride was indeed justified because such an effect accentuated the majesty [page 6] of Mauna Kea and with a snow-covered top the view was truly breathtaking.

Mauna Loa, with its almost constant and gentle slope all the way from Hilo to the summit, made road building alluring. Drainage ditches along the roadside were not required in the lava fields since there was good natural drainage.

The fact that Mauna Loa had erupted about every ten years since records had begun and that there was no record, legend, or evidence obvious to the average person that Mauna Kea had ever erupted did not disfavor the selection of Mauna Loa. Indeed, providing public access for viewing future eruptions was an added attraction... [H. Ellis, 1988:7]

Ellis' narrative also describes the further development of the road from Kūlani to Mauna Loa. By 1949, the road extended nine miles above Kūlani. Mr. Vance's lead man on the project was the late Henry Auwae (a noted Hawaiian healer), who at the time, was employed at Kūlani as an instructor (Ellis 1988: 11). The Kūlani-Mauna Loa was completed by late 1949, and was used as the route of access to the Mauna Loa summit region until 1963 (Ellis, 1988:15).

Another important part of the program at the Kūlani facility has been its' wood workshop and sales venture. For years, inmates have collected native hardwoods from lands around the facility, and turned it into art and utilitarian items for sale. A part of the income goes to the benefit of the inmates themselves, and provides them with a trade skill.

The 1942 Lava Flow Natural Area Reserve

In 1972, Governor Ariyoshi signed Executive Order No. 2720, establishing one of the early Natural Area Reserves in the islands, it being the 1942 Lava Flow Natural Area Reserve. Land for the 640 acre reserve was withdrawn from the older Waiakea Forest Reserve (by Executive Order No. 2719), and described as:

***C.S.F. 16,634
May 26, 1972***

1942 LAVA FLOW NATURAL AREA RESERVE

Waiakea, South Hilo, Island of Hawaii, Hawaii

Being a portion of the Government (Crown) Land of Waiakea.

Beginning at the west corner of this parcel of land, the direct azimuth and distance from Government Survey Triangulation Station "E 1942 FLOW" being 149° 15' 2035.00 feet, and the coordinates of said point of beginning referred to Government Survey Triangulation Station "KULANI" being 41,481.42 feet North and 18,229.29 feet East, thence running by azimuths measured clockwise from True South:—

1. 228° 46' 5,280.00 feet along Upper Waiakea Forest Reserve, Governor's Proclamation dated January 3, 1923;
2. 318° 46' 5,280.00 feet along Upper Waiakea Forest Reserve, Governor's Proclamation dated January 3, 1923;
3. 48° 46' 5,280.00 feet along Upper Waiakea Forest Reserve, Governor's Proclamation dated January 3, 1923;
4. 138° 46' 5,280.00 feet along Upper Waiakea Forest Reserve, Governor's Proclamation dated January 3, 1923 to the point of beginning and containing an AREA OF 640 ACRES...

The formal designation of the 640 acre reserve was authorized by Governor's Executive Order No. 2720, dated December 2nd, 1974.

The Pu'u Maka'ala Natural Area Reserve

The Pu'u Maka'ala Natural Area Reserve is made up of lands that were originally set aside in the early 1900s as a part of the territorial government's resource conservation program. In 1970, Hawai'i became one of the first states in the country to designate unique natural resources as a part of a system of Natural Area Reserves. In accordance with State Law, the NARS are mandated to "preserve in perpetuity specific land and water areas which support communities, as relatively unmodified as possible, of the natural flora and fauna, as well as geological sites, of Hawaii" (HRS 195-1).

In 1981, as a part of the ongoing program to designate unique natural systems as Natural Area Reserves, selected lands of the 'Ōla'a Forest Reserve were withdrawn from reserve. Those lands are described in the following notes of survey:

C.S.F. 18,636
WITHDRAWAL
PORTION OF OLAA FOREST RESERVE [Figure 8]
(Governor's Proclamation dated December 31, 1918)
Olaa, Puna, Island of Hawaii, Hawaii
Withdrawn by E.O. 3095 dated Nov. 2, 1981
(E.O. Folder 67-A)

STATE OF HAWAII
SURVEY DIVISION
DEPT. OF ACCOUNTING AND GENERAL SERVICES
HONOLULU
May 4, 1979

WITHDRAWAL
PORTION OF OLAA FOREST RESERVE
(Governor's Proclamation dated December 31, 1918)
Olaa, Puna, Island of Hawaii, Hawaii

Being portion of the Government (Crown) Land of Olaa.

Beginning at the west corner of this parcel of land, on the boundary between the lands of Waiakea and Olaa, the coordinates of said point of beginning referred to Government Survey Triangulation Station "KULANI" being 5,697.06 feet North and 11,343.77 feet East, thence running by azimuths measured clockwise from True South:—

1. 243° 20' 24,906.00 feet along Upper Waiakea Forest Reserve (Governor's Proclamation dated January 3, 1923), along the boundary between the lands of Waiakea and Olaa.
2. Thence along the contour line 3000 feet above mean sea level, along the remainder of Olaa Forest Reserve (Governor's Proclamation dated December 31, 1918), the direct azimuth and distance being: 353° 48' 52" 15,913.31 feet;
3. 302° 21' 10" 1100.00 feet along the remainder of Olaa Forest Reserve (Governor's Proclamation dated December 31, 1918);
4. 302° 21' 10" 4257.80 feet along Lots 129, 128, 127, 126 and 125, Olaa New Tract Lots;
5. 48° 32' 30" 3057.06 feet along Lot 135-B, Olaa New Tract Lots and along the northwest end of Roadway (50.00 feet wide);
6. 302° 21' 10" 1506.52 feet along the southwest side of Roadway (50.00 feet wide);
7. 34° 08' 30" 7462.10 feet along Lots 99, 98, 97, 96, 95, 94, 93, 92, 91, 90-B and 90-A, Olaa New Tract Lots;
8. 149° 31' 17,853.54 feet along Hawaii Volcanoes National Park, Parcel 6 (Governor's Executive Order 1540);
9. 59° 31' 10,104.01 feet along Hawaii Volcanoes National Park, Parcel 6 (Governor's Executive Order 1540);
10. 138° 32' 30" 8347.71 feet along upper Olaa Forest Reserve (Governor's Proclamation dated October 13, 1913) to the point of beginning and containing an AREA OF 6871 ACRES, MORE OR LESS...

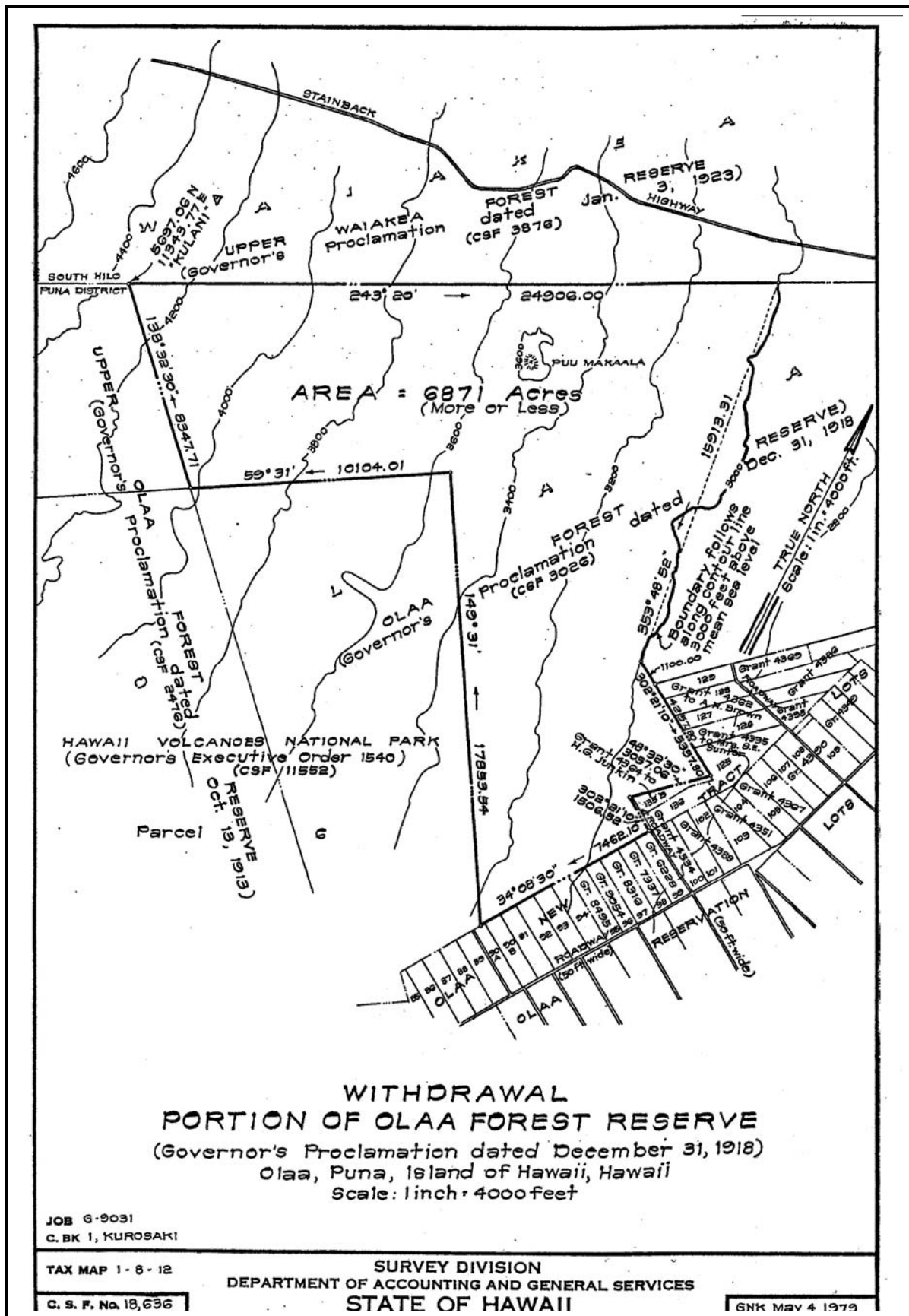


Figure 8. Location of Land Withdrawn From 'Ōla'a Forest Reserve;
Pu'u Maka'ala NAR Section (Hawaii State Survey, 1979)

Compiled from data furnished
by N.A.R.S., U.S.G.S. Map,
& Govt. Survey Records. [State Survey Division]

Executive Order No. 3094

November 2nd, 1981

Withdrawal of Land from the Operation of

Governor's Proclamation of Forest Reserves Dated October 13, 1913.

Whereas, by Governor's Proclamation of Forest Reserves in the Districts of Hilo and Puna, Island of Hawaii, Hawaii, dated October 13, 1913, Certain lands situate in the District of Puna, Island of Hawaii, Hawaii, were set aside for Upper Olaa Forest Reserve, to be under the control and management of the Board of Commissioners of Agriculture and Forestry; and

Whereas, portions of said lands were recommended by the Natural Area Reserves System Commission as Natural Area Reserves; and

Whereas, the Board of Land and natural Resources, at its meeting of November 9, 1978, approved the withdrawal.

Now, Therefore, I, George R. Ariyoshi, Governor of the State of Hawaii, by virtue of the authority vested in me under Section 171-11, Hawaii Revised Statutes, do hereby order that the following described land, more particularly described in Exhibit "A" and delineated on Exhibit "B..." be and the same is hereby withdrawn from the operation of Governor's Proclamation of Forest Reserves dated October 13, 1913... [In Collection of State Survey Division]

C.S.F. 18,635

WITHDRAWAL

PORTION OF UPPER OLAA FOREST RESERVE

(Governor's Proclamation dated October 13, 1913)

Olaa, Puna, Island of Hawaii, Hawaii

Withdrawn by E.O. 3094 dated Nov. 2, 1981

(E.O. Folder 67-A)

STATE OF HAWAII

SURVEY DIVISION

DEPT. OF ACCOUNTING AND GENERAL SERVICES

HONOLULU

May 4, 1979

WITHDRAWAL

PORTION OF UPPER OLAA FOREST RESERVE

(Governor's Proclamation dated October 13, 1913)

Olaa, Puna, Island of Hawaii, Hawaii

Being portion of the Government (Crown Land of Olaa).

Beginning at the west corner of this parcel of land, on the boundary between the lands of Waiakea and Olaa, the coordinates of said point of beginning referred to Government Survey Triangulation Station "KULANI" being 2292.92 feet North and 4565.59 feet East, thence running by azimuths measured clockwise from True South:-

1. 243° 20' 7584.98 feet along Upper Waiakea Forest Reserve (Governor's Proclamation dated January 3, 1923), along the boundary between the lands of Waiakea and Olaa.
2. 318° 32' 30" 8347.71 feet along Olaa Forest Reserve (Governor's Proclamation dated December 31, 1918);
3. 59° 31' 9895.99 feet along Hawaii Volcanoes National Park, Parcel 6 (Governor's Executive Order 1540);
4. 329° 31' 7976.25 feet along Hawaii Volcanoes National Park, Parcel 6 (Governor's Executive Order 1540);
5. 59° 31' 4359.10 feet along Lots 16 and 17, Volcano Farm Lots and along the northwest end of Roadway (50.00 ft. wide);
6. 149° 31' 8016.25 feet along Kilauea Forest Reserve (Governor's Proclamation dated December 22, 1928), along boundary between the lands of Keauhou and Olaa;
7. 180° 00' 10,048.92 feet along Kulani Prison Site (Governor's Executive Order 1225) to the point of beginning and containing an AREA OF 2926.76 ACRES.

Compiled from data furnished
by N.A.R.S & Govt. Survey Records. [State Survey Division]

In 1981, portions of the Waiākea and 'Ōla'a Forest Reserve lands were dedicated to the Pu'u Maka'ala Natural Area Reserve by Governor Waihe'e, in Executive Order No. 3102. The Executive Order provides the following description and purpose of the lands in the NARS:

***Executive Order No. 3102
Setting Aside Land for Public Purposes
November 16, 1981***

FOR NATURAL AREA RESERVE, to be under the control and management of the Department of Land and Natural Resources, State of Hawaii, being the lands situate at Waiakea, South Hilo and Olaa, Puna, Island of Hawaii, Hawaii, and designated as PUU MAKAAALA NATURAL AREA RESERVE, containing an area of 12,106 acres, more or less, all more particularly described in Exhibit "A" and delineated on Exhibit "B", both of which are attached hereto and made a part hereof, said exhibits being a survey description designated as C.S.F. No. 18,646 dated May 4, 1979, and a survey map designated as H.S.S. Plat 933, both prepared by the Survey Division, Department of Accounting and General Services, State of Hawaii...

***Exhibit A
C.S.F. 18,646
May 4, 1979***

***PUU MAKAAALA NATURAL AREA RESERVE
Waiakea, South Hilo and Olaa, Puna
Island of Hawaii, Hawaii***

Being portions of the Government (Crown) Lands of Waiakea and Olaa.

Beginning at the Government Survey Triangulation Station "KULANI" on the common corner of the lands of Keauhou, Waiakea and Olaa, as shown on Government Survey Registered H.S.S. Plat 933 [Figure 9], thence running by azimuths measured clockwise from True South:-

1. 133° 18' 05" 1000.00 feet along Kilauea Forest Reserve (Governor's Proclamation dated December 22, 1928), along the boundary between the lands of Keauhou and Waiakea;
Thence along the south side of Roadway, along the remainder of Kulani Prison Site (Governor's Executive Order 1225) for the next five (5) courses, the direct azimuths and distances between points along said south side of roadway being:
2. 180° 30' 1260.00 feet;
3. 244° 45' 1310.00 feet;
4. 275° 00' 880.00 feet;
5. 293° 40' 1088.17 feet;
6. 318° 25' 753.90 feet to the boundary between the lands of Olaa and Waiakea;
7. 243° 20' 16,520.00 feet along the remainder of Upper Waiakea Forest Reserve (Governor's Proclamation dated January 3, 1923), along the boundary between the lands of Olaa and Waiakea;
8. Thence along the contour line 4000 feet above mean sea level, along the remainder of Upper Waiakea Forest Reserve (Governor's Proclamation dated January 3, 1923), the direct azimuth and distance being:
167° 09' 12" 6808.36 feet to the south side of Stainback Highway;
9. Thence along the south side of Stainback Highway, along the remainder of Upper Waiakea Forest Reserve (Governor's Proclamation dated January 3, 1923), the direct azimuth and distance being:
259° 50' 03" 17,874.62 feet;
10. Thence along the contour line 3000 feet above mean sea level, along the remainder of Upper Waiakea Forest Reserve (Governor's Proclamation dated January 3, 1923), the direct azimuth and distance being:
2° 44' 24" 1761.32 feet to the boundary between the lands of Olaa and Waiakea;
11. Thence along the contour line 3000 feet above mean sea level, along the remainder of Olaa Forest Reserve (Governor's Proclamation dated December 31, 1918), the direct azimuth and distance being:
353° 48' 52" 15,913.31 feet;
12. 302° 21' 10" 1100.00 feet along the remainder of Olaa Forest Reserve (Governor's Proclamation dated December 31, 1918);
13. 302° 21' 10" 4257.80 feet along Lots 129, 128, 127, 126 and 125, Olaa New Tract Lots;
14. 48° 32' 30" 3057.06 feet along Lot 135-B, Olaa New Tract Lots and along the northwest end of Roadway (50.00 ft. wide);
15. 302° 21' 10" 1506.52 feet along the southwest side of Roadway (50.00 ft. wide);
16. 34° 08' 30" 7462.10 feet along Lots 99, 98, 97, 96, 95, 94, 93, 92, 91, 90-B and 90-A, Olaa New Tract Lots;
17. 149° 31' 17,853.54 feet along Hawaii Volcanoes National Park, Parcel 6 (Governor's Executive Order 1540);
18. 59° 31' 20,000.00 feet along Hawaii Volcanoes National Park, Parcel 6 (Governor's Executive Order 1540);
19. 329° 31' 7976.25 feet along Hawaii Volcanoes National Park, Parcel 6 (Governor's Executive Order 1540);

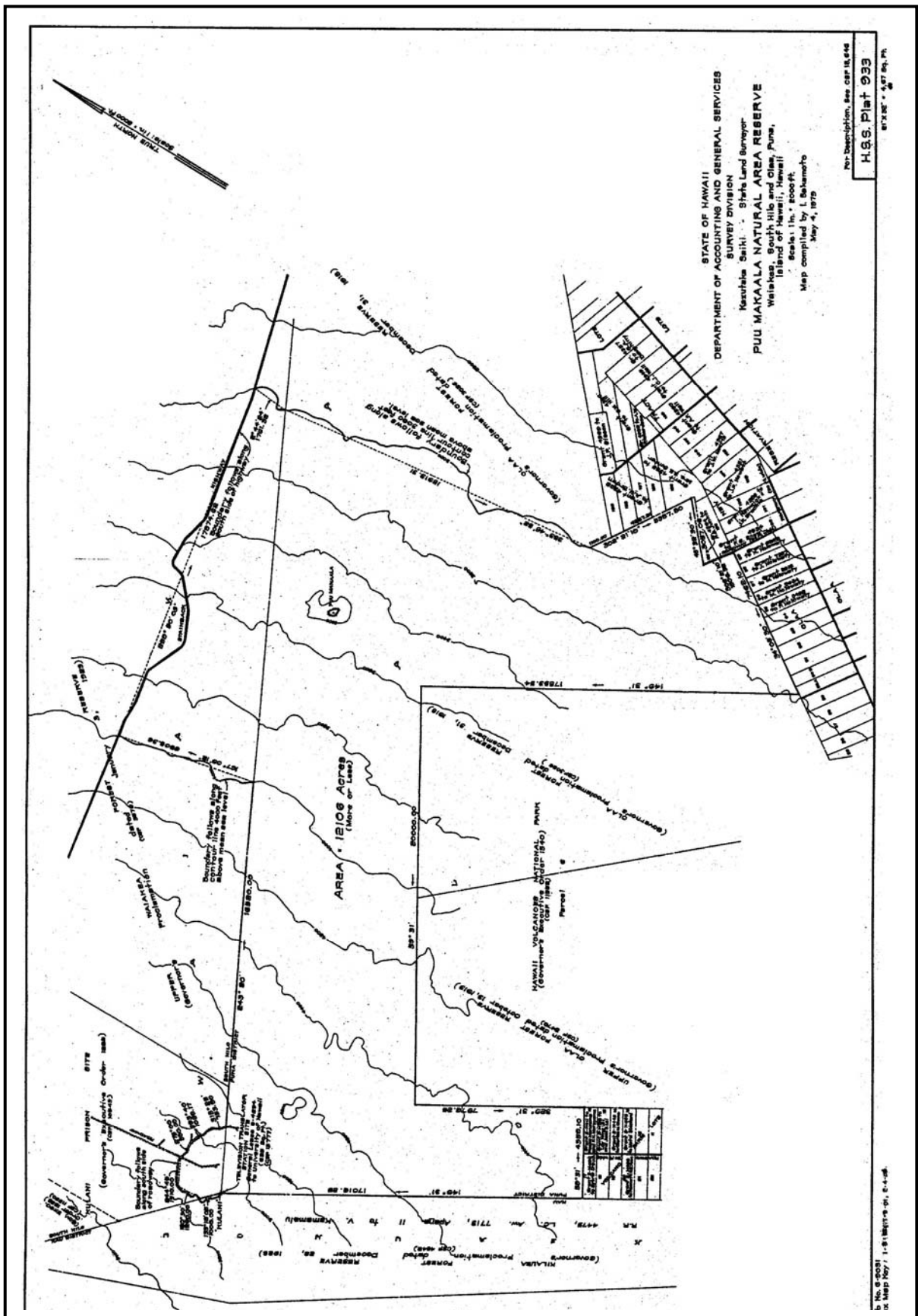


Figure 9. Redcution of Plan of the Pu'u Maka'ala Natural Area Reserve; Plat Map No. 933 (Hawaii State Survey, 1979)

20. 59° 31' 4359.10 feet along Lots 16 and 17, Volcano Farm Lots and along the northwest end of Roadway (50.00 ft. wide);
21. 149° 31' 17,016.25 feet along Kilauea Forest Reserve (Governor's Proclamation dated December 22, 1928), along the boundary between the lands of Keauhou and Olaa to the point of beginning and containing an AREA OF 12106 ACRES, MORE OR LESS.

The above-described PUU MAKAAALA NATURAL AREA RESERVE is subject, however, to the following as shown on plan attached hereto and made a part hereof.

1. Television Translator Station Site covered by General Lease S-4234 to University of Hawaii.

Overview of Resources and Management Objectives for the Pu'u Maka'ala NAR

In 1989, the Department of Land and Natural Resources, Natural Area Reserves System office prepared a management plan for the Pu'u Maka'ala NAR. The following narratives describe resources of the Pu'u Maka'ala NAR and program objectives:

A. General Setting

Puu Makaala Natural Area Reserve occupies 12,106 acres in the Puna and South Hilo districts on the island of Hawaii. Elevations range from 2,800-5,500 feet and the average annual rainfall is 100-175 inches (DLNR 1986). Landmarks include Kulani Cone and Puu Makaala. The reserve is bordered by the Upper Waiakea Forest Reserve on the north, the Kilauea Forest on the west, Olaa Forest Reserve on the east, and the Olaa Tract of Hawaii Volcanoes Park (HAVO) on the south. Kulani Correctional Facility lies just outside the reserve's northwest corner. Access to portions of the reserve is generally good via Wright Road and jeep trails, although public access to the reserve's northern boundary via Stainback Highway is restricted by regulations of the correctional facility.

Regionally, the Puu Makaala reserve represents an important conservation parcel. It provides a link between the lower elevation HAVO Olaa Tract and the higher elevation 'ohia (*Metrosideros polymorpha*)/koa (*Acacia koa*) forests of Kilauea, Kulani and Upper Waiakea, protecting the transition between the 'ohi'a and koa forest types. These forest areas contain a full mosaic of different-aged 'ohi'a stands... [DLNR 1989]

B. FLora

Puu Makaala reserve encompasses some of the Big Island's best wet native forest. Four natural communities occur in the reserve; three are dominated by native species.

'Ohi'a/Hapu'u (*Cibotium* spp.) Montane Wet Forest occupied the majority (11,200 acres or 92%) of the Puu Makaala reserve, meeting with the koa/'ohi'a forest near the western reserve's boundary, and extending east of the reserve. A variety of substrate types, including cinder, 'a'a and pahoehoe flows of variable age, result in a mosaic of different-age stands of 'ohi'a/hapu'u forest. The closed 'ohi'a canopies can exceed 75 feet in height. Other sections of the 'ohi'a/hapu'u forest were in various stages of dieback, ranging from a few senescent trees to sections where all trees are dead and fallen, with only a few snags standing over a 15 to 30 foot canopy dominated by hapu'u and an association of native trees.

The hapu'u, or tree fern layer in this 'ohi'a/hapu'u wet forest is dominated by *Cibotium glaucum*, but *C. chamissoi* and *C. hawaiienses* can be locally abundant. The native

tree association below the 'ohi'a canopy commonly included 'olapa (*Cheirodendron trigynum*); kawa'u (*Ilex anomala*); pilo (*Coprosma* spp.); kolea (*Myrsine lessertiana*); smaller stature 'ohi'a; and occasionally included naio (*Myoparum sandwicense*); manono (*Hedyotis affinis*); loulou (*Pritchardia beccariana*); and 'ohe (*Tetraplasandra* spp.). The vegetation under the hapu'u layer consisted of a mix of native ferns such as *Thelypteris sandwicensis*, ho'i'o (*Athyrium sandwichianum*), 'ama'u (*Sadleria* spp.) and *Dryopteris* spp.; native shrubs such as pu'ahanui (*Broussaisia arguta*), 'ohawai (*Clermontia* spp.), ha'iwale or kanawao ke'oke'o (*Cyrtandra* spp.), *Cyanea* spp., maile (*Alyxia oliviformis*), alani (*Pelea* spp.), and 'ohelo (*Vaccinium* spp.); seedlings of 'olapa, 'ohi'a, kawa'u, kolea and pilo; and herbs such as pa'iniu (*Astelia menziesiana*) and 'ala'alawainui (*Peperomia* spp.). Sedges such as *Carex alligata* and *Uncinia uncinata* were infrequent components of the ground cover. Epiphytic mosses, ferns, herbs and shrubs were present, and occasionally abundant.

Koa/'Ohi'a Montane Wet Forest occupied the northwestern edge of the Puu Makaala reserve on cinder and ash substrate. This community encompasses just 460 acres or 3.8 percent of the reserve. The forest type stretched into the reserve's Kulani Cone area from the adjacent Kilauea Forest. Scattered individual koa trees, from 60 to 120 feet in height, emerge from a layer of 'ohi'a 30 to 90 feet in height. Under the koa and 'ohi'a canopy is an association of native trees that commonly included kolea, kawa'u, 'olapa, pilo and young 'ohi'a, but may also include naio and 'ohe.

The 'ohi'a/hapu'u and koa/'ohi'a wet forests share many of the same component species. The former, however, had an overall higher diversity by virtue of the greater area and elevational range it occupies. Some genera in Puu Makaala, such as *Pritchardia*, *Trematolobelia*, and *Claoxylon*, as well as species such as *anini* (*Eurya sandwicensis*) and *Cyanea tritomantha*, seem restricted to the 'ohi'a/hapu'u forest.

Carex Alligata Montane Wet Grasslands are scattered throughout the reserve as small but distinct patches occupying low lying water-saturated areas such as cinder cone pits or depressions in the forest. Only a few of the *Carex* grasslands were encountered on the ground survey but many examples were seen during helicopter reconnaissance. This grassland may consist entirely of *Carex* but may also include scattered shrubs of 'ohi'a and patches of wawae'iole (*Lycopodium* spp.), especially in ecotones with surrounding forest. Often associated with standing water, this sedge forms a wide margin around a pond. As the pond ages, the basin may become dominated by *Carex*. The largest examples occupy cinder cone craters on **Kulani** and **Na Lua Mahoe**.

Along the eastern boundary, 360 acres of tropical ash (*Fraxinus uhdei*) plantations constitute the reserve's only non-native dominated community. Amidst the scattered ash trees are elements of the surrounding 'ohi'a/hapu'u forest, as well as a variety of non-native plants. At this time, the ash is not invading adjacent native forest in the reserve. There were many non-native plants found within these four natural communities... [DLNR 1989]

C. Fauna.

Systematic circular plots were used to sample birds along transects 4 and 6; and incidental bird observations were made on all other transects. Only two native birds were commonly seen in the reserve during this survey. The *Apapane* (*Himatione sanguinea*) was abundant throughout, except in areas of extensive 'ohi'a dieback. The Hawaiian Thrush, or 'Oma'o (*Myadestes obscurus*) was less abundant, but ubiquitous, being recorded on nearly all stations.

Two other native forest birds, 'i'iwi (*Vestiaria coccinea*) and 'elepaio (*Chasiempis sandwichensis ridgewayi*) were uncommon. The non-native Japanese White-eye

(*Zosterops japonicus*) occurred in low numbers at most stations, whereas Redbilled Leiothrix (*Leiothrix lutea*) were heard at only a few stations. These findings are similar to those of previous surveys except that densities of 'I'iwi, 'elepaio, White-eye, and Leiothrix were lower (Pratt 1988).

Four endangered bird species have been reported from the Puu Makaala reserve, but only one, the 'io (*Buteo solitarius*, Hawaiian Hawk), was seen during the survey. An 'io was seen carrying nesting materials near **Na Lua Mahoe**, and another was seen during transect 6.

The 'o'u (*Psittirostra psittacea*) is extremely rare and localized on the Big Island and Kauai. **Olaa Tract** and kipukas of **Upper Waiakea Forest Reserve**, above Stainback Highway are thought to be primary habitat for 'o'u on the Big Island. 'O'u were last seen in the southwestern portion of the reserve in 1986.

'Akiapola'au (*Hemignathus munroi*) exist only on the Big Island, with the largest population on the windward side (Scott et al. 1986). Generally observed in *koa'ohi'a* forests in this area, 'Akiapola'au sightings are reported from west of the reserve in the Kilauea Forest, and north of **Kulani Cone**. Observed periodically in the reserve's Disappointment Road area, one record also exists from the western edge of the reserve below Kulani Cone.

Hawaii Creeper (*Oreomystis mana*), known from the Big Island's Kona, Kau and windward areas, is one of Hawaii's more abundant endangered forest birds. Creepers have been reported from the reserve's Disappointment Road complex, and the western area near **Kulani Cone** and **Na Lua Mahoe**, as well as south in **Olaa Tract**, and west of the reserve near **Puu Lalaau**.

Hawaii 'Akepa (*Loxops coccineus*) is an uncommon bird on the Big Island. On the windward side, populations are known from the upper slopes of Mauna Kea and Mauna Loa, preferring closed canopy *koa'ohi'a* forests (USFWS 1982). Though 'Akepa have not been reported within the reserve, sightings of this rare bird are recorded from outside the reserve's western boundary in the Kilauea Forest as recently as 1987.

Although native invertebrates were only incidentally noted, a high diversity of representative native insects, spiders and snails (particularly *Succinea* spp.) was observed in all of the natural communities sampled and on all transects. The general richness of native invertebrates suggests that the native communities of the reserve are generally intact, and that major disruptive factors, such as competition with non-native species, have not greatly affected the native invertebrate biota. A lava tube was found and further study may reveal native cave invertebrates of interest.

Non-native fauna such as pigs (*Sus scrofa*) were seen throughout the Reserve and are specifically discussed in the Ungulate Control program. Other non-native mammals, such as rats (*Rattus rattus*) and mongoose (*Herpestes auropunctatus*) have been reported in the Reserve... [DLNR 1989]

Key Management Concerns

The overall management goal is to protect and maintain the reserve's native character.

Some of the key considerations behind the management programs proposed to achieve this are as follows:

- (1) **Puu Makaala** is a very large reserve. At this time it is not economically realistic to intensively manage the entire reserve. Intensive management of key areas are proposed and prioritized based on the biological resources they contain, the extent of current disturbance, the nature of the other biological threats within and near the area, and the feasibility of management (e.g. topography and access).

- (2) Pigs constitute the most severe threat currently affecting the reserve. Their rooting and wallowing destroy native plants and the ground cover on the forest floor. Such damage limits effective regeneration of native plants, and creates conditions favorable for mosquitoes and certain non-native weeds throughout the reserve. This in turn degrades the quality and integrity of native plant communities, threatening the existence of species that rely on the forest for survival.

Control of the feral pig population is the essential first step in the restoration and maintenance of native plant communities in the reserve. Strategic fencing to create smaller pig control units and an aggressive ungulate control program are critical for effective long term reduction of the pig population.

Portions of the reserve are utilized for recreational hunting, which should continue to be encouraged year round. This helps reduce pig densities in certain areas. However, as the number of pigs decrease in priority management areas, public hunting becomes less effective as hunters move to areas with more chance of success, and pig control by staff will be necessary. If incentives can be developed for public hunters to continue to hunt in areas where pig numbers are low, then expensive fence construction and staff hunting may not be necessary.

- (3) 'Ohi'a dieback continues to have an impact in the reserve, especially in the lower elevations. Dieback is a natural successional phenomenon in which older stands die synchronously, leaving gaps in the forest canopy. Dieback itself is not a "threat" as these gaps provide openings for subsequent 'ohi'a regeneration. The management concern in the dieback areas is the invasion of aggressive non-native weeds, accelerated by feral pigs, which hampers native plant regeneration. Aerial photographs indicate over one-third of the 'ohi'a forests in the reserve have undergone relatively recent dieback.
- (4) Many non-native plants observed in the reserve are shade intolerant and pose no major problem as long as the native canopy and ground cover remain intact. There are non-native weed species in the reserve which form monotypic stands and displace native vegetation over large areas, making them priority weeds for management. Weed control activities will focus on these invasive weeds within key management areas, and in localized populations of priority weed species. Biological control efforts for widespread weed species should be supported.
- (5) Signs of marijuana cultivation were seen in the reserve. This illegal activity creates a hazard for people in the reserve. Growers destroy native plants clearing patches for cultivation, introducing new weeds to the forest and spreading others.

Management Programs

The following four management programs outline the long-term goals for the reserve. The management activities within each program lay essential foundations for effective protection of the reserve's natural resources. A six-year implementation schedule is recommended. Although the programs are listed by priority, they fit together to form an integrated management package.

Ungulate Control Program (PUM-RM-01) - Priority #1

GOAL: Reduce impact of pigs to a level that prevents further degradation of the reserve's native species and allows the greatest possible recovery of the reserve's native character.

Statement of the Problem: Techniques available for pig control in the reserve include hunting with or without dogs, snaring, baiting and trapping. Current pig control research recommends use of passive control (e.g. snares and traps) before actively controlling with dogs when possible, unless hunting is already established. There is less investment initially, less upkeep, less chance of the program being overly oriented to hunting, and it is more cost effective in remote areas. Hunting can be alternated with snaring, but snares must be removed from areas prior to hunting to avoid catching dogs. Radio transmitters on lead hunting dogs has improved hunting efficiency and trapping can be useful for the first vulnerable animals in an area.

Reduction is the necessary first phase of a control effort. Long-term funding for fence construction, pig control and fence maintenance are needed. Attempts to reduce pig populations to remnant levels in similar terrain without the use of any fences have not been effective due to unimpeded ingress of animals into areas where population densities were reduced. Funds spent on feral pig control will be ineffective unless pig numbers are reduced to remnant populations and not allowed to build back up to damaging levels.

Alternative Actions and Probable Impacts:

- 1) No action. Accept the continuing deterioration of Puu Makaala's native resources. Pigs destroy native plants, alter the structure of native vegetation, and contribute to the spread of non-native plants. Without control, pigs can be expected to degrade native communities, converting most of the reserve to less diverse assemblages of native plants with non-native weeds.
- 2) Attempt control of feral animals without installation of any fences. Damaging impacts of feral pigs under this alternative will probably be roughly the same as alternative #1, except for portions of the reserve where increased hunting activity may protect small areas of forest. Management resources used for control will be less effective without any fences to keep new pig populations from moving into the reserve.
- 3) Control feral pigs with the aid of fences. This method has proven successful in both HAVO and Haleakala National Park. Initial cost is high, but benefits in preservation of native ecosystems are great. Recovery of native vegetation can occur if feral animals are controlled. The advance of non-native weed species can be slowed and at times reversed. Native plant species surviving only as epiphytes because of feral pig disturbance can become reestablished on the forest floor.

Recommended Action: Alternative #3 is recommended. The two large management zones proposed for intensive pig control and fencing in this plan comprise only one-third of the reserve. Public hunting access is essential and encouraged to control pig populations in the rest of the reserve. However, the goal for the Disappointment Road and Kulani Cone Zones is clearly reduction of the pig population to remnant levels, not sustained yield hunting. Three projects are proposed to carry out this alternative:

Project (1) - Construction of a strategic network of 20.3 miles of barrier fences to create five management zones. Goals of the fencing project are to cut off pig access routes

into priority areas and to direct predictable pig movements within intensive control areas. An aggressive snaring and hunting project is essential in conjunction with the fencing project to take advantage of induced pig movements and to avoid creation of "pig pens."

Although there are eight smaller management units within the Disappointment Road and Kulani Cone Zones, they will not be fenced immediately. A progressive fencing strategy will be used. The outside of the management zones will be fenced before individual management units are closed off. This will allow pig control efforts to begin over a larger area. In addition, success of pig control efforts and monitoring of subsequent vegetation recovery may determine that fences to close off the smaller management units may be unnecessary. The fence system will share 2.3 miles of HAVO fence along the Olaa Tract boundary. Cooperative agreements to share maintenance costs of this fence section will be pursued.

Pig control fences will consist of 39 inch high galvanized woven-wire supplemented along the ground surface by one strand of barbwire stretched tightly across the ground. Woven wire and barbwire will be secured to steel posts placed no more than 10 feet apart. Concreted galvanized pipes may be required to secure the fence line at certain corners. Helicopter transport of fencing materials will be required for remote units...

Strict procedures for clearing fence line will be established to minimize disturbance. Does not include personnel costs for fence line layout and assessment, contract preparation and monitoring. A botanist will walk the flagged fence route to search for rare plants to be avoided by the brushing crew.^[9]

Project (2) - Monthly inspection and maintenance of all fence lines (and after major storms). Inspections will be done in conjunction with other resource management activities such as monitoring and non-native plant control along fence corridors...

Project (3) - Initiate an active pig control program using hunting, trapping, snaring, and other methods as required in the Disappointment Road and Kulani Cone Zones. The goal is to reduce feral pig populations to remnant levels in 4,560 acres of the reserve. Pig control should begin before fence closure in order to chase out populations within the area.

Snares are recommended for the Kulani Cone Zone, where public access is restricted. Snare numbers will increase over time to continue to catch pigs as their densities decrease. The greatest effort is initially setting up the snare groups. These snare groups are left in place, as pigs habitually return to previously used areas. When new areas are found with fresh sign, additional snare groups are set out. Snares in rain forests last six months to a year. Accumulating data on health, sex, and age of captured pigs provides important data in the effectiveness of the snaring program.

Staff hunting is recommended rather than snaring in the Disappointment Road Zone. This will allow time to incorporate interested public hunters into the program. The major limitation with using public hunters is the lack of incentive for hunting an area when the chances of a successful hunt is low. An effective pig control program demands constant hunting pressure, even when pig populations decrease. Incentives such as

⁹ While it is recognized that the natural landscape is a Hawaiian cultural resource, it is recommended as a part of this study, that DLNR-NARS staff and contractors meet with State Historic Preservation staff as a part of the program to plan for the fencing of the Pu'u Maka'ala NAR. The focus of such a meeting should be to discuss types of traditional cultural sites that may be encountered in the field; and to review the laws and protocols for notification and treatment of inadvertent finds of cultural resources.

improved access, contests, and logistical support for volunteer hunters will be offered to maintain public hunter pressure in the Disappointment Road Zone. Contracting out public hunters is also a possibility. If monitoring indicates vegetative recovery from these pig control efforts, snaring will not be used. The use of snares would necessitate closing the area to the public... [DLNR-NARS, 1989]

This study has been undertaken to provide resource managers and the public with important background information, documenting the wide range of cultural values, practices, and knowledge of resources of the Waiākea and 'Ōla'a forest lands. An understanding of the cultural environment will help resource managers and the public ensure that the unique qualities of the Pu'u Maka'ala NAR, remain a healthy and resilient part of the cultural landscape through future generations.

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June 9, 2004

Telephone interview with:

Ralph Daehler

The name “Pu’u Maka’ala” was given to the *pu’u* and forest area in 1961 or 1962, when Ralph Daehler was working on the Board of Agriculture and Forestry’s Reforestation Program. Mr. Daehler recalled that at the time, he was working with old quad maps and aerial photos, identifying areas in which reforestation projects could be developed, and through the photos—the *pu’u* did not appear on old quad maps—he noticed this *pu’u*, which looked very interesting to him. From the photo, it appeared to him that the hill would offer anyone who traveled to it, a great view of all the surrounding lands, and out to the coast of Hilo and Puna.

Mr. Daehler looked around for *kama’āina* to see if anyone knew the name of the *pu’u*, but could find no one familiar with it. During this time, L.W. Bryan had been the Forester, and was just retiring, and Max Landgraf took over. Max’s nick name was *Maka* (eye), because he could see things all over. Mr. Daehler found that the word *ala* with *maka*, could mean wide open or imply a lookout point, so he settled on naming the site Pu’u Maka’ala (interpreted as Lookout Hill).

Shortly thereafter, USGS was updating its’ quads and contacted him about the region in which the *pu’u* is situated. He explained that he had found no name for the *pu’u*, but that he had called it Pu’u Maka’ala for the forestry program. He recalled being surprised later, to find that on the next quadrangle, the name Pu’u Maka’ala appeared in print.

Mr. Daehler never had the opportunity to actual travel to the *pu’u*, as he was transferred to Kaua’i a short while later. It had been his goal to establish a trail to the *pu’u*, which he believed would be of interest, and provide travelers with a great view of the region. In his review of the maps and photos, he had determined a couple of possible approaches to the *pu’u*. One of the approaches being from the old Olaa Back Road—which was all overgrown—and which ran out of the old Olaa Homesteads. He recalled also, that while researching the area, he had been surprised to learn that so much of ‘Ōla’a had been subdivided into homestead lots, and that many of the homesteaders had been of Galician origin.

Mr. Daehler also recalled that in those early years, the Board of Agriculture and Forestry had a strong component of land development for agricultural purposes. At the time the Board’s Reforestation Program began, a number of people had been calling for the Pana’ewa-‘Ōla’a forest lands to be cleared for agricultural purposes. The early reforestation program, through planting a number of fast growing introduced species, helped to save much of the area for present-day and future conservation programs and public interest.